

REMARKS

This Application has been carefully reviewed in light of the Office Action mailed February 7, 2006. Claims 1-26 are pending in the Application. For the reasons given below, Applicants submit that the pending claims are patentably distinguishable over the cited references. Applicants, therefore, respectfully request reconsideration and favorable action in this case.

I. Section 103 Rejections Over Kitajima

The Examiner rejects Claims 1-6, 8-9, 11-18, 20-21, 23-24 and 26 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,515,196 issued to Kitajima ("*Kitajima*") in view of U.S. Patent No. 6,417,958 issued to Du et al. ("*Du*").

Claim 1 of the present Application recites the following limitations:

A method for transmitting information in an optical communication system, comprising:
modulating a non-intensity characteristic of an optical carrier signal with a data signal to generate an optical information signal;
transmitting the optical information signal over an optical link; and
amplifying the optical information signal over a length of the optical link with a co-launched amplification signal traveling in a same direction as the optical information signal in the optical link.

Independent Claims 13, 23 and 26 recite similar, although not identical, limitations.

In order to establish a *prima facie* case of obviousness, three requirements must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge available to one skilled in the art, to modify a reference or combine multiple references; (2) there must be a reasonable expectation of success; and (3) the prior art reference (or combination of references) must teach or suggest all of the claim limitations. M.P.E.P. § 2143. With respect to the *Kitajima-Du*, a *prima facie* case of obviousness cannot be maintained because neither *Kitajima* nor *Du* provides a suggestion or motivation to combine the references. The question raised under 35 U.S.C. § 103 is whether the prior art taken as a whole would suggest the claimed invention taken as a whole to one of ordinary

skill in the art at the time of the invention. *See* 35 U.S.C. § 103(a) (2000). Accordingly, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill at the time of the invention would have been prompted to combine the teachings of multiple references to arrive at the claimed invention.

The M.P.E.P. sets forth the strict legal standard for establishing a *prima facie* case of obviousness based on modification or combination of prior art references:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references where combined) must teach or suggest all the claim limitations.

M.P.E.P. chs. 2142-43 (Rev. 2, May 2004). “To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. All words in a claim must be considered in judging the patentability of that claim against the prior art.” M.P.E.P. ch. 2143.03 (Rev. 2, May 2004) (citations omitted).

In addition, the M.P.E.P. and the Federal Circuit repeatedly warn against using an applicant’s disclosure as a blueprint to reconstruct the claimed invention. For example, the M.P.E.P. states, “The tendency to resort to ‘hindsight’ based upon applicant’s disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.” M.P.E.P. ch. 2142 (Rev. 2, May 2004). The governing Federal Circuit cases are equally clear.

A critical step in analyzing the patentability of claims pursuant to [35 U.S.C. § 103] is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. . . . Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one “to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher.”

In re Kotzab, 217 F.3d 1365, 1369, 55 U.S.P.Q.2d 1313, 1316 (Fed. Cir. 2000) (citations omitted).

The Examiner argues that it would be obvious to modify the system of *Kitajima* to add the co-propagating amplifier of *Du* because *Du* indicates the use of a co-launched amplification signal to provide for a reduction of signal-pump-signal cross talk (citing Col 3, lines 31-37). However, *Du* actually discloses that a co-propagating Raman amplifier *increases* cross-talk. *Column 1, lines 21-32*. The invention of *Du* is directed at a way of reducing this cross-talk when using a co-propagating Raman amplifier. Therefore, *Du* certainly does not motivate one to *add* a co-propagating amplifier to reduce cross-talk – instead it discloses how to deal with *increased* cross-talk if a co-propagating amplifier is used.

Furthermore, there is no disclosure or suggestion in *Du* that modulating a non-intensity characteristic of an optical signal with a data signal reduces cross-talk when using a co-propagating amplifier. Applicants refer the Examiner to Column 3, lines 49-64 of *Du*, which summarizes the ways that *Du* proposes to reduce such cross-talk (also see Figures 11-13 and the accompanying description for a detailed discussion of the proposed techniques). None of these proposed techniques relates to modulating a non-intensity characteristic of an optical signal, and there is no disclosure or suggestion in *Du* that a non-intensity modulated signal provides any advantages when using a co-propagating Raman amplifier. Therefore, there is no suggestion or motivation to combine a non-intensity modulated signal with *Du*'s disclosure of the use of a co-propagating Raman amplifier. In fact, *Du* teaches away from the use of a co-propagating Raman amplifier except when using those systems specifically disclosed in *Du* (which do not modulate a non-intensity characteristic of an optical signal) since these are the only situations in which *Du* recognizes that the cross-talk created by a co-propagating Raman amplifier is sufficiently reduced.

Therefore, because there is no suggestion or motivation to combine the teachings of *Du* and *Kitajima*, Applicants respectfully submit that Claims 1, 13, 23 and 26 are in condition for allowance. Furthermore, the claims that depend from these allowable independent claims

(including Claims 2-6, 8-9, 11-12, 14-18, 20-21, and 24) are also in condition for allowance. Therefore, Applicants respectfully request allowance of these claims.

In addition to depending from an allowable independent claim, the claims dependent from Claims 1, 13, and 23 are also allowable given the additional limitations that these claims recite. For example, dependent Claims 2 and 14 recite that the co-launched amplification signal travels at a substantially the same speed as the optical information signal. In the Office Action, the Examiner asserts that since both of these signals are light signals, they travel at the same speed (i.e., “the speed of light”). Applicants respectfully disagree with this assertion. The speed of light is constant in a vacuum. However, in a transmission media (such as an optical fiber), the speed at which “light” travels varies by its wavelength. For example, it is this well-known phenomenon that causes chromatic dispersion in an optical signal. Therefore, Applicants respectfully submit that the limitations are Claims 2 and 14 are not taught in the cited references and are not disclosed based on the constant speed of light in a vacuum. For at least this additional reason, Applicants request reconsideration and allowance of Claims 2 and 14.

Furthermore, dependent Claim 11 recites “further amplifying the signal [the signal that was amplified using co-launch amplification] in the optical link with a discrete amplifier,” and Claim 12 recites that this discrete amplifier is an erbium-doped fiber amplifier (EDFA). Although *Kitajima* discloses the use of a discrete amplifier and *Du* discloses the use of a Raman amplifier, there is no teaching in either reference of the claimed limitation – amplifying a signal using both types of amplifiers. Furthermore, there is no motivation provided in the references or given by the Examiner to combine the use of two different amplifiers disclosed in these two different references. For at least this additional reason, Applicants respectfully request reconsideration and allowance of Claims 11 and 12.

The Examiner also rejects Claims 7, 10, 19, 22, and 25 under 35 U.S.C. § 103(a) as being unpatentable over *Kitajima* in view of *Du* and further in view of U.S. Patent No. 6,556,327 issued to Ohya (“*Ohya*”). Claims 7, 10, 19, 22, and 25 are each dependent from

one of independent Claims 1, 13, and 23, discussed above. Therefore, at least because they depend from an allowable independent claims, Applicants respectfully request reconsideration and allowance of Claims 7, 10, 19, 22, and 25.

II. Section 103 Rejections Over Bergano

The Examiner also rejects Claims 1-5, 7-9, 11-17, 19-21, 23, and 25-26 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,310,709 issued to Bergano ("*Bergano '709*") in view of *Du*.

As described in the Appeal Brief recently filed by the Applicants, a *prima facie* case of obviousness based on these references cannot be maintained for at least two reasons. First, neither *Bergano '709* nor *Du* provides a suggestion or motivation to combine the references. Furthermore, even assuming for the sake of argument that the references did suggest or motivate a combination of the references to a person of ordinary skill in the art at the time of the invention, *Bergano '709* and *Du*, whether considered singly, in combination with one another, or in combination with information generally available to those of ordinary skill in the art at the time of the invention, still fail to disclose all of the elements of the pending claims.

A. The References Do Not Disclose Each and Every Limitation of the Claims

First, *Bergano '709* and *Du* do not disclose each and every limitation of any of the rejected claims. For example, independent Claim 1 recites "modulating a non-intensity characteristic of an optical carrier signal with a data signal to generate an optical information signal." Independent Claims 13 and 23 recite similar, although not identical, limitations. In the Office Action, the Examiner argues that this limitation is disclosed in *Bergano '709* (by elements 102 of Figure 1). However, Applicants respectfully submit that this is not the case. Element 102 of Figure 1 is a data modulator that "that modulates the signal to impart information in a *conventional* manner to produce a modulated optical information signal 103." *Column 2, lines 28-32* (emphasis added). It also discloses that the data modulator "modulates the optical signal 101 *at a frequency* determined by a clock 106 via a clock signal

on line 117.” *Column 2, lines 34-36*. The Examiner has argued in past Office Actions¹ that he believes that this means that frequency modulation is used. However, the fact that the modulator operates at a frequency indicates to Applicants that the frequency is *not* being modulated (since it operates at a single frequency). As an example only, Applicants own application happens to describe *intensity* modulating a signal with a clock frequency (see Page 14, line 30 -- Page 15, line 11 and Figure 4). In any case, *Bergano '709* certainly does not specifically disclose that data modulator modulates the data onto the signal using non-intensity modulation, as required by Claims 1, 13, 23 and 26.

Furthermore, *Bergano '709* suggests that the “conventional” technique used by the data modulator to modulate the data onto the signal is *intensity* modulation.² See *Column 2, line 60 – Column 3, line 1*. However, the Examiner has argued in past Office Actions that frequency modulation is a “conventional” modulation scheme. Applicants submit that there is no support in the cited references for this proposition (and, in fact, *Bergano '709* instead suggests that intensity modulation is being used). The Examiner appears to argue on page 7 of the Final Office Action before Applicants’ Appeal Brief was filed that frequency modulation is a conventional modulation scheme “[g]iven that Applicant has failed to specify a conventional modulation scheme and given the broadest reasonable interpretation of a conventional modulation scheme.” Applicants have no duty to specify what *Bergano '709* means by modulating a signal in a “conventional manner” (as it appears the Examiner is implying). The burden is on the Examiner to prove that the claims are obvious based on the cited reference (although, in this case, Applicants have actually shown what *Bergano '709* means by “conventional manner” – intensity modulation). Furthermore, in past Office Actions, the Examiner has incorrectly applied a claim interpretation standard to the prior art by stating that he can expand the teachings of the prior art to their “broadest reasonable interpretation.” Again, in any case, *Bergano '709* does not disclose that data modulator modulates the data onto the signal using non-intensity modulation, as required by Claims 1,

¹ Since the Examiner has not provided any explanation as to how *Bergano '709* teaches this limitation (beyond pointing to element 102), Applicants assume the Examiner is maintaining his previous arguments relating to this limitation and will again address those arguments.

² The reference indicates that the electric field of the optical signal upon which the phase modulator 108 acts (i.e., the optical signal onto which data modulator 102 has modulated the data) is a function of the intensity modulation of the signal upon which phase modulator acts. This indicates that this signal has been intensity modulated and the only modulator that acted on the signal before the phase modulator 108 is the data modulator 102. Thus, the data modulator 102 must be an intensity modulator.

13, 23 and 26. Again, it suggests the opposite.

Therefore, *Bergano '709* does not disclose “modulating a non-intensity characteristic of an optical carrier signal with a data signal to generate an optical information signal,” as recited in Claim 1, and as similarly recited in Claims 13 and 23. Furthermore, as the Examiner recognizes, *Du* also does not disclose this limitation. Therefore, for at least this reason, the *Du-Bergano '709* combination does not disclose each and every limitation of any of the rejected claims.

B. There Is No Suggestion or Motivation to Combine the References

Second, there is no suggestion or motivation to combine *Du* and *Bergano '709*. As with the *Kitajima-Du* combination, the Examiner argues that it would be obvious to modify the system of *Bergano '709* to add the co-propagating amplifier of *Du* because *Du* indicates the use of a co-launched amplification signal to provide for a reduction of signal-pump-signal cross talk (citing Col 3, lines 31-37). However, as discussed above, *Du* actually discloses that a co-propagating Raman amplifier *increases* cross-talk. *Column 1, lines 21-32*. The invention of *Du* is directed at a way of reducing this cross-talk when using a co-propagating Raman amplifier. Therefore, *Du* certainly does not motivate one to *add* a co-propagating amplifier to reduce cross-talk (instead it discloses how to deal with *increased* cross-talk if a co-propagating amplifier is used).

Furthermore, there is no disclosure or suggestion in *Du* that modulating a non-intensity characteristic of an optical signal with a data signal reduces cross-talk when using a co-propagating amplifier. Applicants refer the Examiner to Column 3, lines 49-64 of *Du*, which summarizes the ways that *Du* proposes to reduce such cross-talk (also see Figures 11-13 and the accompanying description for a detailed discussion of the proposed techniques). None of these proposed techniques relates to modulating a non-intensity characteristic of an optical signal, and there is no disclosure or suggestion in *Du* that a non-intensity modulated signal provides any advantages when using a co-propagating Raman amplifier. Therefore, even if *Bergano '709* disclosed modulating a non-intensity characteristic of an optical signal with a data signal (which it does not, as discussed above), there is no suggestion or motivation to combine a non-intensity modulated signal with *Du's* disclosure of the use of a

co-propagating Raman amplifier. In fact, *Du* teaches away from the use of a co-propagating Raman amplifier except when using those systems specifically disclosed in *Du* (which do not modulate a non-intensity characteristic of an optical signal) since these are the only situations in which *Du* recognizes that the cross-talk created by a co-propagating Raman amplifier is sufficiently reduced.

Therefore, because neither *Du* nor *Bergano* '709 disclose each and every limitation of Claims 1, 13, 23 or 26 and because there is no suggestion or motivation to combine the teachings of *Du* and *Bergano* '709, Applicants respectfully submit that Claims 1, 13, 23 and 26 are in condition for allowance. Furthermore, the claims that depend from these allowable independent claims (including Claims 2-5, 7-9, 11-12, 14-17, 19-21, and 25) are also in condition for allowance. Therefore, Applicants respectfully request allowance of these claims.

The Examiner also rejects Claims 6, 10, 18, 22, and 24 under 35 U.S.C. § 103(a) as being unpatentable over *Bergano* in view of *Du*, and further in view of *Ohya*. Claims 6, 10, 18, 22, and 24 are each dependent from one of independent Claims 1, 13, and 23, discussed above. Therefore, at least because they depend from an allowable independent claims, Applicants respectfully request reconsideration and allowance of Claims 6, 10, 18, 22, and 24.

CONCLUSION

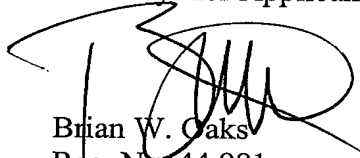
Applicants have made an earnest attempt to place this case in condition for allowance. For at least the foregoing reasons, Applicants respectfully request full allowance of all the pending claims.

If the present application is not allowed and/or if one or more of the rejections is maintained, Applicants hereby request a telephone conference with the Examiner and further requests that the Examiner contact the undersigned attorney to schedule the telephone conference.

Applicants believe no fees are due, however, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 02-0384 of BAKER BOTTS L.L.P.

Respectfully submitted,

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